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Vol. XIV.—No 33. CLEVELAND, AUGUST 13, 1881. No. 706

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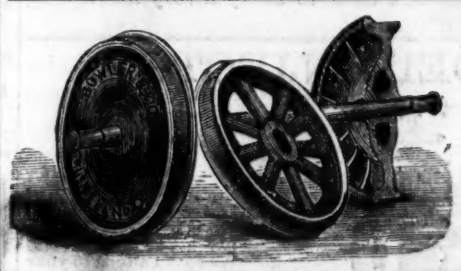

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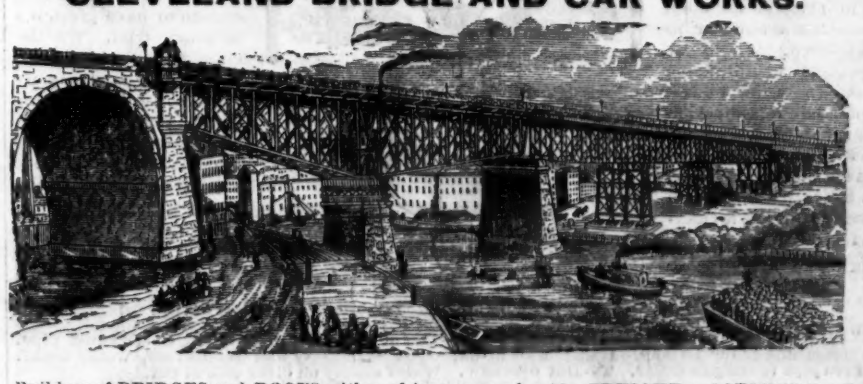

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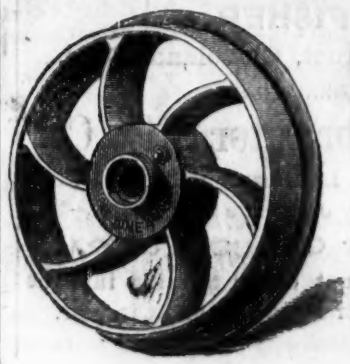

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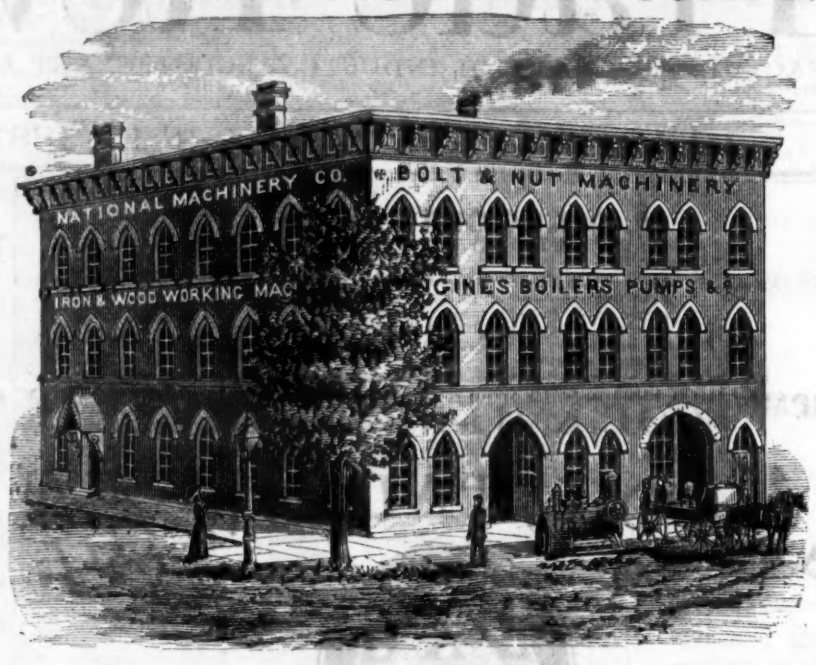

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One small Pond hand Milling machine. Price $100.
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Gents.:

We have had one of Hogue's Graded Injectors on our boiler since last June, and are pleased to state that it has never failed to perform its duty, separating the water as represented. At first we were skeptical of its doing what we were told it would, but it compels us to say that it surpasses any machine we have ever seen for putting water into a boiler. We wish you success. Our lift is eighteen feet.

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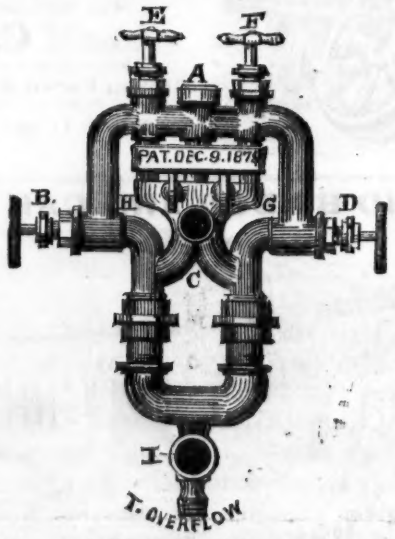

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WM. DALRYMPLE.

EXPLANATION.--A--Steam supply pipe. B--Steam supply for forcing. C--Exhaust pipe. D--Steam supply for forcing. E and F--Cut-off, water stems. G and H--Cut-off, water cocks. J--Feed pipe leading to boiler. T--Hot overflow. Water supply on other side of cut.

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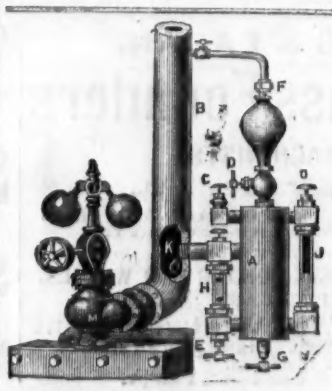

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A constant source of pleasure. Simple in construction. Not liable to get out of order, and easily operated.

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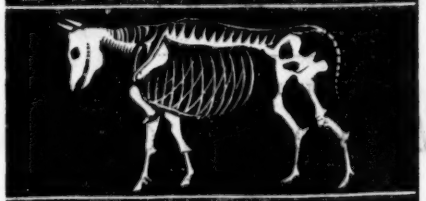

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STORAGE OF ELECTRICITY.

No proposed accomplishment, short of the electric light, has awakened more interest than that of the storage of electricity for the purpose of rendering it portable and available for the running of light machines at all times and places, besides supplying domestic electric lighting. From a paper read before the Societe d'Encouragement de l'Industrie Nationale by M. Reynier, upon a new form of battery invented by M. Camille Faure, who, following in the footsteps of M. Gaston Plante, had succeeded—according to M. Reynier—in devising a battery in which forty times as much electric energy may be stored up as could be done by the Plante pile, a discussion sprang up as to the real value of this "bottling." It was urged that if electrical energy has to be conveyed from one place to another, it is a matter of small commercial importance in the abstract whether it is conveyed by means of metallic conductors or stored up in reservoirs and carried by road or rail; in this the commercial question involved being very much the same as that of the supplying of water by pipes or by water-carts. There is no doubt, says the *Engineer*, which system is, save in exceptional cases, the most convenient, and unless it can be shown that the charging and transmission of storage reservoirs offers advantages upon economical grounds, or very substantial conveniences of application over the system of transmission by conductors, we cannot see that its commercial application upon a large scale can be as remunerative to its proprietors as its promoters would wish to make the public believe. On the occasion to which we have referred, the statements that have been put forth that the Faure battery would give out 80 per cent of the total power used in charging it in electrical or mechanical power, was severely challenged. "As to the value of such a battery," it continues, "as a mechanical agent we have to bear in mind first that it creates nothing. It can only give back a portion of the energy expended in producing the chemical change in the red lead, and there is every reason to believe that if employed to turn the best dynamo-electric motor to be had, not more than 50 per cent of the original energy would be given back. Thus, instead of 1,000,000 foot pounds in a box of one cubic foot capacity, we should have but 500,000 foot pounds effective. But the great claim persistently urged for the Faure battery is involved in the idea that it represents vast concentrated energy—that nothing to parallel it in this respect is to be found in the whole world. Thanks are due to Professor Osborne Reynolds, of Owen's College, who lost no time in replying to Sir W. Thomson's statements. 'The means of storing and re-storing mechanical energy,' writes Professor Reynolds, 'form the aspiration not only of Sir William, but of every educated mechanic. It is, however, a question of degree, and is it not completely disappointing? Large numbers are apt to create a wrong impression until we inquire what is a unit. Eleven million foot-pounds of energy is what is stored in one pound of ordinary coal. So that in this box, weighing 75 pounds, there was just as much energy as in 1½ ounces of coal, which might have been brought from Paris or anywhere else in a waistcoat pocket, or have been sent by letter.' Professor Reynolds here hits the precise point which required hitting. The Faure battery is so far from being a unique and extraordinary storer-up of energy that its powers are really insignificant as compared with other arrangements."

People are ever ready to forecast the career of any new invention. Even if M. Faure's battery can get back all the material ingredients of the energy it supplies to use over and over again, it is yet in no position to take the place of coal, which we never recover after it is dissipated. The probability is that as a motor power electricity will long continue to be subordinate to coal. It took generations to improve the steam engine, and the triumphs that await electricity are not to be won in a day. In reference to this Sir William Thompson pertinently says, "as a rule we do not in the arrangements of our household life turn our backs upon our water cans and cisterns because we find that water can be more economically distributed by pipes than by pails. The cans will not be used where the pipes can be employed. But they will, nevertheless, beat the pipes out of the field for special services to which they are better adapted. Elastic hose and force pumps will never take the place of tea cups. So also will it assuredly be in the end with these new methods of electrical storage and transport. The electrical hand-can of M. Faure will have its opportunity and use." The value of this youngest offspring of inventive ingenuity must be left to the arbitrament of time.

ALLEGED STORAGE OF HEAT.

A French invention is announced by which heat may be made portable, and supplied both in volume and intensity according to individual demand. It is to be called the thermophere, though this Greek compound name will doubtless be turned to heat-magazine, should it become a success. The inventor, M. Carriere, says that the box in which he stores the heat is filled with layers of exceedingly thin metal (possibly iridio-platinum,) which has a great capacity for receiving heat without melting. Each sheet is separated by a sheet of extremely fine silk saturated with liquid oxygen, and thus rendered incapable of transmitting heat until the silk is removed, the liquid being as true a non-conductor of heat as silk is of electricity and infinitely more effective. Heat to the full capacity or the required degree is first imparted to the metal sheets, which are covered with the saturated silk and placed layer upon layer within the magazine, any desired amount of heat, it is affirmed, being afterwards set free by the withdrawal of the corresponding amount of the protecting film. Mr. Carriere affirms that the sun does the work of heating his plates, his method being the same as that by which Archimedes is said to have burned the enemy's fleet as it lay before Alexandria. Numerous highly polished mirrors are so arranged as to focus all their heat and light reflected from the sun upon the metal plates which are to be used in the magazine, and this heat, as is well known, can thus be made as intense as that of the electric are. Each plate when undergoing the heating process lies upon a film of the silk saturated with the non-conducting liquid hydrogen, the heat cannot be conducted away from below. As soon as the required temperature has been attained the upper surface of the plate is covered with another film of ths oxygen which drops over the edges, and the whole is deposited in the box. There were 3,000 plates in the box shown to the Paris correspondent of the *N. Y. World*, representing an amount of heat which, if set free all at once by the withdrawal of the films, would be sufficient if turned into work to pick up a mass of rock weighing 1,500 tons and throw it four times as high as the summit of the Aimalayas. The story as it stands, and which we have condensed, partakes more of the ideal than the practical, and like others we await some practical test.

OHIO ORE AND IRON MARKETS.

Arrivals of iron ore at Cleveland and the lower Lake ports have been extensive. We quote:

CHARCOAL PIG IRON.

No. 1 Lake Superior Charcoal	$30 00 @ 32 00
No. 2 Lake Superior Charcoal	30 00 @ 32 00
No. 3 Lake Superior Charcoal	32 50 @ 33 50
No. 4 Lake Superior Charcoal	33 00 @ 33 50
Nos. 5 and 6 Lake Superior Charcoal	31 00 @ 33 00
Nos. 1, 2, 3, 4, 5 Salisbury	42 00 @ 45 00
Nos. 1, 2, 3, 4, 5 Tennessee cold blast	38 00 @ 40 00

There has been a further strengthening of prices in finished iron. Rail mills are actively engaged in filling orders, All the steel rails have orders sufficient to continue operations far into next year. The condition of the foreign iron trade is necessarily being closely watched and there are evidences abroad of some improvement. The margin separating American from foreign iron is, however, somewhat narrow. A number of makers of sheet iron have advanced their prices. The difficulty with consumers of plate and tank iron is in obtaining supplies; a number of holders are unwilling to sell at present prices; many manufacturers refuse to sell to other than regular customers. For structural iron the demand is active. The following are the Cleveland rates of

BITUMINOUS AND COKE IRON.

No. 1 Foundry from Lake Superior ores	$25 00
No. 2 Foundry from Lake Superior ores	24 50 @ 26 00
No. 1 Foundry from Lake Superior ores with cinder mixture	23 00 @ 24 00
No. 2 Foundry from Lake Superior ores, with cinder mixture	23 00
No. 1 Foundry from native Ohio ores	22 50 @ 24 00
No. 2 Foundry from native Ohio ores	21 00 @ 22 50
No. 1 Silvery Foundry, native Ohio ores	21 00
No. 2 Silvery Foundry, native Ohio ores	20 00 @ 21 50
No. 1 Gray Forge from Lake Superior ores	25 00
No. 1 Gray Forge, mixture of ores	21 50 @ 22 00
White and Mottled Forge Iron	20 00
No. 1 Specular, Bessemer quality	$9 00@10 00
No. 1 Magnetic, Bessemer quality	9 50@10 00
No. 1 Hematite, Bessemer quality	6 25@ 6 50
No. 1 Specular, mill ores	9 00@ 9 25
No. 1 Magnetic, mill ores	8 75@ 9 00
No. 1 Hematite, mill ores	6 00@ 6 50
Menominee Range ores	6 00@ 9 00

FUTURE COPPER SUPPLY.

COMPARATIVELY but a short time will elapse before it will be out of the power of the principal copper mining company of Lake Superior to control copper to the disadvantage of our own manufacturers of articles of this metal, by a policy which we must characterize as extremely discreditable. This policy has been to sell their surplus below the price ruling here for shipment to foreign markets, thus giving certain foreign manufacturers of articles of copper and its alloys a clear advantage over our own. It is evident that consumers here have been thus unduly taxed; and that the advantages of protection have thus been countervailed. "Even in the West Indies, lying at our very doors, our manufacturers have been unable to compete with foreign makers who use Lake Superior copper, by reasons of the exactions of this offensive

monopoly. In no country has the manufacture of brass and brass and brass goods been brought to such perfection as in the United States, and the expansion of this important branch of our manufacturing industry has only been retarded by the abnormally high cost ot the base of the mixture, copper. There is no metal now so extensively used in the making of all descriptions of household utensils as brass, and the liberation of copper from the prohibitive exactions under which it has so long been held would at once result in the growth of our already important brass trade, and the distribution of our excellent wares throughout the world." The remedy will come in the large supplies to be furnished from Arizona and New New Mexico, and which have sent already the price of Lake Superior copper down from 19 to 16 cents per lb. In addition we may look to a vast enlargement in our foreign trade in copper. The requirements of this country are estimated at 25,000 tons per annum, but with an important reduction in the price of the article use can be found for double the amount. The scale on which copper is destined to be worked would seem to preclude any effective combination on the part of copper producers. In this article relief from monopoly will be widely welcome.

MOVEMENT OF WHEELS ON CURVES.

The difference of opinion that continues to exist among engineers as to the actual and relative movent of the inner and outer wheels of railway cars passing over a curve in the track, a difference mostly showing itself in dubious remarks at the various meetings at which the subject turns up, is certainly matter for surprise; and it is no wonder that satirists should have indulged in sarcasms at the expense of scientists. At the late convention of the National Car Builders, some of whose members may be supposed to be interested in the matter, as it directly concerns the coning of wheels, a member stated that he had been informed by those whose business it was to know the condition of railway tracks, that the sliding of the wheels on curves was on the outer rail, the opposite wheels being forced on to the inner rail up to their flanges, and causing them to run on their largest circumference, while the outer ones run on their smallest circumference, and at the same time the most weight being thrown on the inner rail relieves the outer wheel and causes them to slip. If this was so, the coning of a wheel adds to its size just where the increased size is not wanted, and diminishes its size just where it ought not to be dimished. Another member doubted the theory that the inside wheels as a rule pressed their flanges in curving against the inside rail. Much, he remarked, would depend on the momentum of the train. If the train was going rapidly it would naturally follow the outer rail. He believed that this was the case with all trains moving as slow as 15 miles an hour even. A third member remarked that on short curves especially, the outside rails had to be renewed oftener than the inside ones, which showed that the pressure and wear upon them was the greatest. An enquiry here sprung up from another quarter as to how it was that the wheel slid on the outside rail when the friction surface was the largest? Also, how it was that the outer rail was pushed forward while the inner one remained stationary. A car builder of note here vouchsafed the information that it had always been supposed that coned wheels would more readily get around curves, for the reason that the outer rail, being the longest, the wheel went to that side, and that running there on its largest diameter, and on its smallest on the inner rail, it got around easier. He had never before heard the correctness of this theory questioned. But is there any mere theory, unsettled by observed facts, that is not questioned? The latter speaker expressed the belief that in curving the outer wheels slipped forward and the inner ones back, more or less, and referred to the peculiar, snake-like motion imparted to trains by short curves after getting on the straight track, the remedy for which was sought in making the cones 3-16 of an inch. If wheels are not coned at all there is always danger of mounting the outer rails. It is required by a natural law that in order to get round a curve the wheels must either have different diameters or some equivalent therefor must be provided, and this is the cone, and the more there is of it the less friction there is on the outer rail. Would that this glorious uncertainty as to the actual movement of wheels of railway cars along a curve were removed.

The railway war in rates continues with unabated ardor. The rate from New York to Chicago continues at $7, the Erie and the Baltimore and Ohio which sell limited tickets being patronized exclusively by the scalpers, to the detriment of the Pennsylvania & New York Central lines. The Grand Trunk, which has all along been allowed in the joint arrangement to make rates lower than the direct lines, gives passenger tickets from Chicago to Boston for $5, covering for this amount a distance of 1,235 miles. The action of the Grand Trunk is considered by the other competing lines atrocious. The *Railway Gazette* remarks: "West bound rates are badly demoralized, and of all signs of the times this is the worst, the roads being all bound by a definite contract to a division of the business, and its traffic being this year remarkably large." The action of the Grand Trunk is likely to reduce the rates on other roads. Lake and canal rates have declined, and the cost by lake and canal from Chicago to New York is 5¼ to to 5½ cents. The ocean rate of transport from New York by steam to Liverpool ranges from 5¾d. to 5d. per bushel."

What we want in the way of metals is a good supply of native tin, to render us independent of British operators, who have laid their hands on the product of the existing mines in Cornwall and the Far East. Tin enters so largely into our manufactures that on the score of purity alone a native supply is desirable. Our canned goods trade has been injured by admixture of lead with the tin in heavy proportions, and a good proportion of culinary articles are tin only in name. The business of tinning or covering iron with tin is a rapidly growing one. With a full supply of this metal business in it would be vastly extended. Fortunately, according to the *Commercial* of Los Angeles, Cal., an enormous deposit of the ore has been discovered at Pomona, no great distance from that city, assays from which show a result of $89.70 per ton in tin. This mass of tin ore had previously been mistaken by prospectors for common rock stained with iron. We shall watch with interest the developments.

It would appear from the successful metallurgical enterprise of the Tharsis Sulphur and Copper Co., Glasgow, Scotland, that the pyritous ores of which there is such an enormous amount in this country,can be put to profitable account. The above company has cleared in one year as net profit from treating pyrites, an ore that is thrown aside as waste in this country, $91,000. That any profit could be made at all is a wonder. The process should be looked up by enterprising capitalists in this country.

Subscribers and others when writing to advertisers will confer a favor on the publishers by mentioning that they saw their advertisement in the columns of the Trade Review.

MANUFACTURES.

TO MACHINISTS, MANUFACTURERS AND OTHERS.

The publishers of The Trade Review solicit items of information concerning manufacturing and other establishments in any part of the country, and all such items will be promptly inserted in these columns, free of charge. Facts are the only things needed; and all communications should be accompanied with the name of the contributor—not for publication—but as a guarantee of good faith.

Manufacturers, machinist and engineers are particularly requested to communicate any matters of interest relating to their specialties. No one need be deterred from sending any interesting facts in his own language, as all such contributions will be properly revised before sendin to press.

OHIO.

Andrew Bros.' mill, Hazleton, is on double with bright prospects.

George R. Gale, Cleveland, is furnishing the machinery for Messrs. Pounds & Loweth's mill at Lorain.

Akron parties have agreed to take all the brick the Ellio Tile Company, Milton, can manufacture.

The Stillwell & Bierce Manufacturing Company, Dayton, announce that they will soon place on the market a new rolling mill.

Morgan, Williams & Co., Alliance, have built a large steam hammer for the Cape Ann Forge Works, Gloucester, Mass., and are now ready to build the heaviest class of forgings.

A new section blast, which separates all dust from the oats as it is hulled, has just been put into practical operation at the Wadsworth Mills, Wadsworth, and is highly satisfactory.

Aultman Miller & Co., proprietors of the Buckeye Mower and Reaper Works, Akron, have determined to make two additions, one erection to be 158 by 50 feet and the other 61 by 72.

The Long & Allstatter Company, Hamilton, manufacturers of power punches, shears, etc., are at work on several heavy machines for the Gautier Steel Company, Johnstown, Pa.—*Chicago Indus. World.*

Monitor Furnace is now operated by by the Car Wheel Iron Co., and is making an average of from 6½ to 7 tons car wheel iron per day, selling the iron nearly as fast as it is made, which, proves how much value it has in the market. Her present blast, which commenced on the 18th of June, to consist of 1500 tone, will likely last until February next.—*Ibid.*

The new Forest City Co-operative Stove Company, Cleveland, melted its first iron on the 8th inst., and starts off with every indication of soon becoming one of the leading industrial establishments of the city.—*Cleveland Herald.*

The Stillwell & Bearce Manufacturing Company, of Dayton, some months ago sent one of their "Victor" wheels to France, and it is reported upon as highly satisfactory. Within a week they have sent two Victors to England to run paper mills, both being 48 inches in diameter.

A fire broke out on the 1st inst. in the linseed oil works of James Israel, Mt. Vernon. The engine and machinery rooms were destroyed, the loss, which amounts to $20,000 including four hydraulic presses and other machinery for manufacturing linseed oil, and about five hundred bushels of flaxseed. Fully insured.

A correspondent of the Boston *Journal of Commerce* writes as follows from Toledo, O.: Because of the expensiveness of power in the past, the manufacture of flour in this city has been limited to less than 100,000 barrels a year, although our elevators, with a capacity of 50,000,000 bushels, have been overflowing with grain, and during the last year Toledo received 30,047,333 bushels of wheat, being a larger amount by nearly 7,000,000 bushels than was received at any other market in the West. The introduction of cheap power has already shown a change in this important industry. A. H. Detwiler, from Philadelphia, and Furgerson & Watkins, from Wheeling, W. Va., all men of experience and associated with men of capital, have recently engaged in the manufacture of flour in this city. Mr. A. Bruns, from the adjoining county, has secured the site, and is now preparing plans for a mill with the most improved machinery, and capacity to produce 1,000 barrels of flour daily.

The Columbus Warm Air Furnace Company, Columbus, is, we understand, doing a splendid business. The system it carries out precludes the issue from the pipes of smoke, dust and draughts, defects which have tended to limit the use of warm air furnaces. The company having overcome these drawbacks has bright prospects in view.

The Cadiz Mill, Ferguson & Rife, has started again on the Jonathan Mills system. The change has cost $14,000. The wheat is run through six Reduction Machines, the first of which merely splits the grain, and each in its turn breaking it gradually finer, and last of all it goes through the ordinary burrs and is ground into flour. It will grind about 3,750 bushels of wheat per week, and allowing for stoppages, perhaps about 175,000 bushels a year.

One of the devices, says the *American Miller*, that has grown into general use is the burr rubber, made of corundum and similar material, the advantages of which for use on the furrows and face of millstones are now generally appreciated by millers. Mr. Horace Deal, of Bucyrus, who makes one of the best known of these implements, known as Deal's Corundum Polisher, writes us that he is having a splendid trade, sending them all over the United States, Canada, Europe and Auttralia.

The purchasers of Perkin's Agricultural warehouse property are Alexander & Trowbridge, dealers in agricultural implements, corner of Canal and West Market streets. These gentlemen will combine their interests with Messrs. Gaylord & Barnes, of Cleveland, manufacturers of the celebrated horse-yoke. The new firm will be known as the Akron Implement Manufacturing Co. The building to be occupied is of frame, 70x140 feet in dimensions, two stories with double basement. A 40-horse power engine will be placed in the building to run the necessary machinery. Besides the horse-yoke the Company will also manufacture Alexander & Trowbridge's pokes, corn planters, harrows, corn cultivators and wagon jacks.

It is evident that the Akron Iron Company, must, at no distant day, materially enlarge their already extensive works in this city. The demand upon this institution comes through their rapidly increasing business in their hot polished shafting, on which particular kind of iron this company holds a patent, and which is becoming so popular throughout the entire country that the present facilities are far from adequate to meet the demand. A double force of men is kept working, so that the mill is now running day and night. A large amount of the hot polished shafting is now being used for silver mill stamp stems, in pounding gold and silver quartz in the western mining districts, the sales of ore for this purpose amounting to hundreds of tons annually, and bidding fair to increase largely in the future, as the iron is just the thing required for the purpose, and far superior to anything heretofore used. The trade in hot polished shafting, although comparativelry of recent growth, has already spread throughout the entire United States, large orders coming from Maryland, Tennessee, North Carolina, Arkansas, Colorado, California, Massachusetts, Kentucky, New Hampshire, &c., while the leading cities of the continent are large buyers. The mill is kept so busy on this one kind of iron that orders for hundreds of tons of common bar iron have already been refused. At present a new polishing machine and a new engine are being placed in position, and will soon be in operation.——J. P. Merriman, Pittsburgh, has purchased the Crescent Iron Works, Pomeroy —— At Newark Mr. A. B. Coffman has just closed the contract for building the new agricultural shops, to cost $60,000.—*Akron Beacon.*

Our enterprising contemporary the *Sandusky Daily Register* furnishes the following account of leading manufactures in that city: Messrs. Jay C. Butler & Co., who manufacture doors, sash, blinds and decorative woodwork and have long enjoyed the reputation of doing the very best work in that line, have recently erected one of the largest, finest and best appointed factories in Ohio. Their extensive establishment is supplied with all the latest improved woodworking machinery, operated by skilled workmen.——Messrs. Frederick and W. Olemacher own and operate stone quarries covering 70 acres on Marblehead, and in this city six iron "perpetual" lime kilns of the largest capacity, three of which elevate their stone by steam and three by water power from the city water works. With a total force of 60 men or over, Messrs. Olemacher Bros. dig the limestone from their own famous rock beds on Marblehead, transport it in their own boats across Sandusky's beautiful bay, burn it in their own splendid kilns here, producing from the natural rock 600 barrels of lime daily, that averages 88 per cent in absolute purity, shipped in barrels made in their own cooper shops, to all parts of the great central west. The Marblehead lime, such as produced by this enterprising firm, is the purest lime known to consumers, and the favorite brand above all others, with the men who make the paper on which editors fight their battles in words with their flaming swords of truth or words to that effect.——The firm G. B. Hodgman & Co. is composed of Messrs. G. B. Hodgman and O. A. Knight. They manufacture solely fish and syrup packages, occupy for their factory a valuable piece of ground at the east end of Water street, covering two docks, and an area for their factory grounds alone of two acres or more. Messrs. Hodgman & Co have a Western branch factory at St. Louis from which they supply a large trade through the great West and Northwest. Their main cooper shop here is 156 by 30 feet, their mill 80x50, kit shops 40x22, and these, with five large storage buildings, makes the largest factory of its kind, we believe, in the entire country. They give constant employment to over one hundred workmen, turn out the packages from the log, first sawing into stave and heading. The daily capacity of their Sandusky works is 2,000 packages.—— Among the most extensive manufacturing institutions in the State is that of the Sandusky Tool Company, whose factory was established here in 1869, and has since that time been in successful operation. The company employs about 200 men, who are kept busy ten hours per day. They manufacture planes, planters and German hoes and handles of every description. It makes a specialty of hoes, and turns out many thousands of them annually, The shops are fully equipped with the most modern improvements. President, J. E. Marshall; Treasurer, Mozart Gallup; Secretary, J. P. Knight.——The Sandusky Machine and Agricultural Works is one of the oldest leading manufacturing institutions of Sandusky. As now operated, it is consolidated with the Kiotz & Kromer Machine Works, also for a number of years past one of our most widely known factories. The officers of the works are President, W. F. Converse; Secretary, Otto Kromer; Treasurer, August Klotz; Superintendent, Frank Rinkleff. The company manufactures first and foremost the celebrated Hero Reaper under their own letters patent, a harvester that is rapidly making its way to the very front rank in a field of mechanic arts that is perhaps more closely contested than any covered by American ingenuity. The Hero has had a remarkably prosperous career this season, the firm being unable to fill all their orders, and the machine everywhere meeting successfully the severest tests. The Hero combines the three cardinal points —durability, perfect work and lightness of draft. The S. M. & A. Company manufacture and hold patent for also, as a companion piece to reapers, the Excelsior one-horse cleaner and binder, a most valuable invention, because it completes the modern harvesting outfit of the American farmer, doing economically and perfectly with the reaper the work that the most costly, complicated and at present experimental self binding harvester can do. The company do a large amount of manufacturing in iron—steam engines, the new "Favorite" circular saw mills, power corn shellers, axe handle and spoke machinery, and general machine and foundry order work. They are now making over one hundred tons of castings, columns, posts, etc., for Lima's new Opera House.——The Sandusky Wheel Company holds the distinction of being the largest manufacturing institution in our city. The works cover some three acres of ground at the west end of Water street, and the factory proper is one of the largest in the West. Built of our Sandusky blue limestone, it is three-stories high, constructed in the form of an L. 190 feet on Shelly street, 120 feet on Water, and 52 feet in width. None but the best modern machinery for the purpose required can be found on its floors, and the rapidity and facility with which wheels, buggy bodies and seats are turned out will astonish the stranger within its massive walls. The immense engine that operates the vast machinery occupies a separate building, and there are numerous dry-houses, sheds and store houses. It supplies a wide field through the great West, Central and Western States. The company is managed by the following officers: President, John M. Boalt; Vice-President and Treasurer, C. M. Conk; Superintendent, A. F. Hubbell; Secretary, O. B. Bannister. ——The Enterprise Manufacturing Company, which occupies a valuable site covered with stone and brick buildings, manufactures baskets of all sizes, from the two quart to the housewife's clothes basket, and all the grades of splint for the grocer, the fruit dealer and the farmer. The company start with the log as it comes from the forest, saw it to proper lengths and steam it, run it from the steaming house to the veneering machine, a splendid piece of mechanical invention that revolves the log against a knife gauged to shave it up into one long strip of veneer, the thickness of your finger nail. A huge cutter, worked automatically, cuts these thin strips into splints the proper width. A score or more boys take these strips to their braiding tables, and with their feet operating the treadle and their nimble fingers acting as shuttles, they weave the strips into the form that makes up the basket. This piece of woven splints then passes to a workman who, operating an iron frame slide the shape of a basket, that slips over another solid iron cast of the same shape, like the block of a hat, places the woven pieces of splints between these frames, and with treadle that suddenly crowds the one frame over the block, presses the basket into its shape, and with hammer and tacks put on the band. So rapidly and accurately do these basket makers work that an experienced man turns out 45 to 50 dozen baskets per day. From the moulds the basket goes to a nicely adjusted sawing gear with sliding feed, that cuts the extending splinters from the rim. The handle makers near by put on and nail the handles already pressed to the proper shape, and the log with which we started in the yard is now converted into hundreds of baskets, light, snug, and useful in the economy of life. The Enterprise Manufacturing Company, in addition to the manufacture of splint baskets, makes hoops for barrels and kegs, head liners, veneerings and thin cut lumber generally used in the manufacture of wooden and furniture wares. The gentlemen who comprise the company and manage it are Messrs. C. C. Nott, Philip Herder and George Meyers. They are men who combine experience in the business with enterprise, capital and honorable dealing.

The Foreign Commerce of the United States.

From information furnished by the chief of the Bureau of Statistics, it appears that the excess of imports of gold and silver coin and bullion, for the fiscal year just closed, has been $91,168,650, against $75,891,391 for the fiscal year ending June 30th, 1880. The excess of exports of merchandise, for the twelve months just closed, is $259,726,254, against $167,683,912, for the corresponding period ending June, 1880, and is a larger excess of exports than for any preceding year with the exception of the fiscal year 1879. The value of the exports of merchandise during the last year exceeded the value of the imports of 1880 by $66,680,815, an increase of 7.30 per cent. Since the year ended June 1875, the value of exports from the United States over that of imports into the United States, has amounted to $1,180,681,641. During the last ten years the value of the exports of merchandise has increased from $442,820.178 during 1871, to $902,-319,473 during the year 1881. The exports of specie exceeded the imports during each fiscal year from 1862 to 1879, but during the last two fiscal years the imports of specie exceeded the exports by $167,060,041.

Foaming in Steam Boilers.

Foaming in steam boilers may occur from several causes—defective construction or careless management. The most common cause is doubtless faulty construction, as where boilers with a large amount of heating surface have an insufficient steam room, and especially where these faults are combined with such an arrangement of the internal parts as to hinder free and rapid circulation. Besides this, boilers will foam when they are unduly charged with dirt, grease or soapy substances; from excessive firing; by changing the water from fresh to salt (in marine boilers); and from other causes. The remedies, in a general way, are to provide ample steam room and good circulation, to keep the boiler clean, and to fire moderately.—*N. Y. Manf'r. & Builder.*

CORRESPONDENCE.

[From the Traveling Correspondent of the Trade Review.]

Zanesville, O., Aug. 9.

Zanesville is a charming city. It was laid out in 1879 by Jonathan Zane. from whom it derives its name, and John McIntyre. Its commercial and manufacturing facilities and the agricultural wealth of the county of Muskingum have favored it, and in connection with the enterprise of its business men have rendered it rich and flourishing. It is located on the right and left banks of the Muskingum river, and that portion west of the river is again divided by Licking river, while the different sections of the city are connected by solid and fine bridges, rendering communication as easy as though streets existed where bridges do. Its railroad facilities are excellent, and it is the sixth city of Ohio in size. The rich veins of iron ore that surround the city will no doubt in time be fully worked, and give to it increased wealth and importance. One palpable evidence of growing prosperity consists in the numerous public buildings and private residences which are springing up. The city is justly proud of its Opera House, the entrance to which is through a 19 feet wide and 70 feet long under the main tower. I found the parquette and balcony richly upholstered. The house has a seating capacity, without crowding, of 1,100 persons, and has the amplest facilities in the way of exit. It was opened in January last with great success, a social event never equalled in Eastern Ohio. A letter has been placed in my hands written by Miss Emma Abott, from Georgia, to Messrs. Schultz & Co., expressing the gratification which the beauty of the Zanesville Opera House afforded her. She says: "Though I have sung in many of the finest Opera Houses in Europe and America, (among them the Italian Opera House, London, and the Pagliano, in Florence,) I consider the accoustic properties of your theater equal, if not superior to those of any Opera House in which I have ever appeared." This is something to the credit of American science, as well as to the accomplished architect, Mr Todd. ——The oldest machine shop in the city is that of Duvall & Co. Here was built was first portable engine in Ohio. The firm was established in 1830 and re-organized in 1856 and 1876. They manufacture in addition to steam engines, grist mills, circular saw mills, and all kinds of first class machinery. The works turn out on an average three engines per week. The shipments are all over the country. I must commend the beautiful workmanship and superior finish of their stationary engines. They have manufactured upwards of 1,700 of these.——The Ohio Iron Company occupies the first rolling mill that was built here. The builders were Newell, Davis, James & Co., and it went into operation in 1848, then comprising one muck, one bar and one guide-mill train, with a limited number of rollers, four boiling and two heating furnaces. This firm was known as the Zanesville Rolling Mill Company (incorporated), which subsequently became insolvent. The present firm, the Ohio Iron Company, was organized in 1857, with a capital of $75,000. The rolling mill has been generally improved, enlarged and added to. It now comprises five separate trains, with a full complement of rolls to each, twenty boiling and eight heating furnaces, and two railroad spike machines. The Company own 600 acres of coal and 100 acres of ore land in Perry county, eighteen acres of land in the city, and have over two acres covered with buildings and machinery. Their shipping facilities are unsurpassed. The business has now a capital of half a million dollars. Its yearly capacity is 13,000 tons of pig iron and 9,000 tons of manufactured iron. The latter comprises over three hundred different sizes, merchant bars, angle iron, light T rails and railway spikes. There are in use three batteries of boilers, ten stationary engines—two of five hundred horse power each—and four steam pumps. The company gives employment to 500 men, besides aiding incidentally in the maintenance of 2,500 others, and the influence of this enterprising company is felt by all. Mr. H. Vicker, a gentleman of fine business qualifications, is the efficient salesman and traveling agent of the company. The present officers of the company are: M. Churchill, President and General Manager; C. W. Green, Secretary, Treasurer and Manager of Blast Furnace; A. F. Cassell, Mill Manager.——Messrs. H. & F. Blandy, manufacturers of steam engines, saw and grist mills, blast furnace machinery and mill fittings, are very busy. Their pride is the improvements they have introduced into their patent engines and boilers. They have built up an enormous trade in mill machinery. I noticed that in their boilers there are fewer seams than boiler makers usually introduce.—— A soap factory has ordinarily the reputation of being unsavory but in that of Messss. Schultz & Co. I really inhaled some delightful scents and essences added to the contents of some caldrons during the boiling operation. This firm are the makers of the best and most original family soaps on the market. They commenced business in 1853. Their buildings were very limited in space and they had only a local trade of $2,000 a year. Now their orders come from all over the Union, and the business amounts to half a million dollars per annum. The capacity of their works may be judged from the fact that they turn out daily 600 boxes, each box containing 60 pounds. They also manufacture tallow oil and candles. Their main building is four stories in height, and contains five enormous boiling tanks. They supply about thirty brands of soap, the leading brands being Star, Irish, Gold and Vaterland.——J. Burgess & Sons, who carry on the business of stoves, tinware and house furnishing goods, spring from the firm of Burgess & Brother, who established themselves in this line in 1853. Subsequently the brother withdrew, and in 1876 Mr. Burgess associated with himself his two sons, Edward T. and Charles J. In busy seasons the stock aggregates 20,000, and the yearly business done cannot fall short of $130,000. Mr. Burgess is the inventor and manufacturer of the celebrated "Gasoline Soldering Furnace," which has a reputation among tinners throughout the country as being the most convenient and economical furnace in use. Large numbers have been sold from Maine to California. At present there are over nine thousand in use, with a constantly increasing demand. The trade of this house extends throughout the Muskingum Valley and is gradually establishing itself throughout other portions of this and adjoining States. In twenty years it has grown from the small tin-shop, to a concern that has a name and business extending throughout the land, and doing a business that is a credit to Zanesville.——In a city of so much opulence and trade, the manufacture of carriages, buggies, phaetons, &c., necessarily occupies an important position. F. W. Fortune is the leading maker, the local trade alone keeping his works continuously busy. His saddle trees are shipped all over the country.——The Muskingum File Works afford employment all the year round to ten first-class file makers. Mr. Rockel, the proprietor, manufactures these of the first material, and marvellous skill is shown in recutting old files.

Muncie, Ind., Aug. 10.

This is one of the busiest cities it has been my lot to visit. Mr. James Boiçe, manufacturer of flax and jute bagging and flax and hemp machinery, has one of the largest establishments of this kind in the country and employs about 125 hands. Near it is the manufactory of Mr. L. L. Weller, the inventor of the celebrated Weller organ. The destruction by fire of the Muncie Washing Machine Company, noticed in your last issue, is more than a local calamity; it is presumed that the premises will be promptly rebuilt. Messrs. Haynes & Co., manufacturers of portable and stationary engines, boilers, &c., represent the largest business of this kind in this city; their shops are well situated for their large business, giving them shipping facilities necessary to the heavy work they turn out. The firm is composed of the following gentlemen: J. H. Wysor, D. T. Haynes, A. F. Patterson, Wm. Boistierton and Geo. W. Green.——The Western Gate Company are preparing to do an extensive business. The gate is the invention of Mr. Nathan H. Long, of Muncie. It is got up on the automatic plan. The *Scientific American* in speaking of it says: "It is a simple and very effective automatic gate. It presents none of the objectionable features found in that class of gates. It has but few parts all of which are durable and substantial."——John S. Reed, manufacturer of hubs and spokes, is crowded with work. Men and machinery are putting in full time. He hopes soon to take a rest, which is rather doubtful as orders are coming in rapidly. To look through the drying house one would think there were hubs sufficient for all the wagons in creation, yet the whole is shipped as soon as seasoned.

C. T. M.

MECHANICAL RECEIPTS AND ITEMS.

Strength of Boiler Tubes.

According to an experiment recently tried by the Hartford Steam Boiler Insurance Company, of Hartford, Conn., the holding power of tubes in boilers is ample when merely expanded, without any beading or riveting over the ends. Three-inch tubes were expanded into a three-eighth inch plate, and stood, in three examples, without yielding, 6,000, 4,500, and 7,000 pounds dead pull.

Temper of Steel.

The temper of steel is due to the chemical union of the iron with the carbon. At low temperatures this union takes place only in a slight degree, and hence in soft steel we have the carbon keeping aloof from the iron; but as the temperature is raised the combination is furthered, until in the case of grey or glass hard steel we have really a kind of diamond alloyed with iron. Sudden cooling is necessary to fix the combination, for in slow cooling the carbon separates out again from the iron. This view is supported by a variety of facts; Mr. Strob, for example, having observed that when an electric spark passes between two iron contact-pieces and fuses them, the fused part becomes diamond-hard and will scratch a file. Recent researches by Mr. T. W. Hogg have also led him to a similar conclusion, namely, the temper of steel is due to the presence of an unstable compound of iron and carbon. The color of the surface of tempered steel depends on the temperature, and is due to the thickness of the film or skin of oxide; the blue film signifying a higher temperature than the yellow, as well as a thicker coating. In this connection Professor Hughes has demonstrated that the electric resistance of the film increases with the temperature. A novel illustration of metallic skins was furnished by Professor Guthrie, who exhibited a steel chain to which he had given a beautiful bluish-black protective coating by simply dipping it in melted nitrate of potash or common nitre. The process was discovered accidentally, and as the bloom improves the appearance of the metal, it will probably be applied to utensils of iron and fancy articles.

To Bleach Ivory for Cutlery.

Mr. A. H. Mason, in discussing the properties of peroxide of hydrogen before the Liverpool Chemists' Association, said: "It is used in Sheffield to bleach the interior ivory for knife handles. The liquid is supplied by an ivory dealer in London, and consists of an aqueous solution of peroxide of hydrogen, of which it contains 29 per cent of rather crude H2 O2. The mode of proceedure is as follows: Place, say, two quarts of the liquid in a stone pot, adding four ounces liquid ammon. fort 880 deg., immerse the handles, and put over a common shop-stove for 24 to 36 hours. The handles are then taken out and gradually dried in the air, not too quickly, or they would split. The deep color of the ivory is removed, and a beautiful pearly white ivory results when polished."

Acid Finishing for Brass.

Sometimes the lathe, or vise finishing, of brass is objectionable to the eye, and sometimes cast brass requires or admits of no such finish. The acid finish in such cases is very handsome and is readily obtained. In large manufactories of cast brass and sheet metal goods this method is extensively used, and sometimes the surface is further finished, or protected, rather, by lacquer or varnish, but the acid finish is by many preferred. If the work to be operated upon is greasy the grease may be removed by heat and then the piece should be cleaned with water slightly acidulated with nitric acid, or by soda water followed by clear water. It is then ready to be dipped in the finishing bath. This may be two parts nitric acid and one water; or in place of entire nitric acid there may be one part of sulphuric acid and sal-ammoniac to two parts nitric acid. In either case the acid must be very strong as only a momentary immersion should be allowed, otherwise the metal may be eaten in pinholes. Experience is necessary here, as commercial acids are not of constant strength, and the brass composition is not always of the same exact proportions of metals. When taken from the bath, the brass must be plunged into clear cold water, washed in hot water and dried in hot saw dust.

The flax crop of Iowa this year will be immense. It is everywhere and in all stages of maturity.

ITEMS OF INTEREST.

The Amalgamated Association of steel workers have admitted a large body of Canadian iron workers into their Union.

A paper dome thirty feet in diameter, and weighing about two tons, is being made for the new observatory at West Point.

If you are lost in the city never make enquiries of a coal dealer; they often tell you the wrong weigh.—*Boston Com. Bulletin.*

We have had paper car wheels and sawdust car wheels, but now there is still another experiment in cloth car wheels. They are a French invention and await a test.

There are 300,000 miles of telegraph wire in the United States, and 33,155,991 messages were sent during 1880. This does not include lines used exclusively for railroad business.

The crop prospects of the Dominion of Canada place the harvest below that of any year in the past decade except in 1876. Fall wheat is 12 per cent below the average, and spring wheat 8 per cent below.

Americans are the largest consumers of Japan tea. Out of 14,210,078 pounds exported from Hiogo alone 1880, 9,539,533 were invoiced in New York, 2,422,295 to Chicago, 80,980 to San Francisco, and only 2,167,171 to other countries.

The Brush Electric Lighting Company of Boston are now prepared to light in that city warehouses, factories, railway stations, and any building or large open spaces wherever a strong, steady light, free from heat, is required.

The value of wheat flour exported during the last fiscal year increased over the preceding one $10,000,000. This is due to the superior quality of American flour, and also to the fact that it can be laid down in Europe at a price which enables our manfacturers to compete with the foreign article.—*Boston Com. Bulletin.*

Sugar imported into the United States from the Hawaiian Islands, and admitted free of duty under the reciprocity treaty, is steadily increasing in quantity. For eleven months ended May 31, 1881, official returns show imports of sugar amounting 62,361,089 pounds, valued at $4,019,217—an increase over the corresponding period of previous year of 8,404,172 pounds.

It is estimated that the increase in the total amount of business transacted through the postal money order system during the last fiscal year will amount to $8,000,000 or $10,000,000 over that of the preceding year, or $110,000,000 to $112,000,000. The foreign exchange with Europe averages about £10,000 a week, and has been largely increased by the opening of mines in the West and by the resumption of specie payments, which does away with the necessity of making all changes through the New York office.

People are tolerably familiar with the fisheries of the Columbia and Sacramento; they do not know, however, that from Astoria to the Arctic ocean the whole coast is susceptible of being transformed into a vast fishery sufficient to supply the world. Explorers on the Yukon, the great river of Alaska—the Mississippi of the north—relate how the salmon left rotting by the tide at its retreat may be counted in incredible numbers. Capital and enterprise will develop this great source of food supply as the world needs it. The value of this industry in 1880 is given by the Census Commissioners at $3,389,938."—*N. Y. Amer. Protectionist.*

The merchants' line of propellers have now been running between Cleveland and Montreal about three months, and the success of the project is a positive fact; so much that the managers of the company have decided to build two new propellers to run in connection with the propellers now on the line. Mr. W. E. Geddes, general manager of the company, is located at Montreal, and Mr. H. P. Chamberlin is the agent at Cleveland. The two new boats will be much larger than the California and Africa, being the full size of the locks. They will carry from 700 to 800 tons of merchandise, and 125 passengers. The boats will make semi-weekly trips to Montreal as soon as the new boats are out, which will probably be early next season.—*Cleveland Herald.*

A careful investigation by Judge S. H. Pitkin, shows that the yield of wheat in Summit County, O., will fall below 33⅓ per cent whereas the State Board of Agriculture estimated the fall off at only 25 per cent.

The Hudson River Tunnel, New York, is now progressing at the rate of about five feet a day. The length of the tunnel from shore to shore will be 5,400 feet. The approaches will add about as much more to the length. The work now extends about 300 feet.

There are in the State of Indiana 17 grain distilleries, 92 fruit distilleries, 63 breweries, 10 rectifiers of distilled spirits, 63 wholesale liquor dealers, 7 tobacco factories and 326 cigar factories. from these the government annually derives a revenue of over $6,000,000.

The San Francisco Custom House returns show a remarkable increase in the sugar trade of the Pacific States. The importations for the first five months of the present year were 40 per cent larger than for the corresponding period of 1880, and amounted to 50,250,998 lbs.

The first arrival of the tea crop of China in London prove very poor and dealers are holding off in the hope that the later shipments will prove much better in quality; but from all accounts they are likely to be disappointed, there being no reasonable doubt as to the poor quality of this crop.

Les Mondes publishes the following method of distinguishing spurious honey: A solution of 20 parts of honey in 60 parts of water, mixed with alcohol gives a heavy white precipitate of dextrine, if glucose has been added. Genuine honey, when treated in the same way, merely becomes milky.

Mr. S. Dana Horton has given the statistics connected with the production and use of gold and silver a very careful study. This study has led to the estimate that the total stock of gold in the world is $5,500,000,000, of which $3,600,000,000 is used as money. The total stock of silver is estimated at $7,500,000,000, of which $3,200,000,000 is used as money.

A correspondent of the *American Machinist* writes: "As a sort of 'shop kink' I give you a curious experiment tried on an engine water-supply pipe that had become choked up with lime incrustation. After hammering it for an hour or two and kindling a fire all over it, without any result, one end was plugged us, and about a pint of refined coal oil was poured in the other end—all it would hold— leaving it stand all night. The next morning the entire mass slid out, a solid lime core. Before trying this we thought of throwing the pipe away as useless, and getting a new one."

Several years ago, while lecturing before a class of ladies on chemistry, we had occasion to purify some quicksilver by forcing it through a chamois leather. The scrap remained on the table after the lecture, and an old lady, thinking it would be very nice to wrap her gold spectacles in, accordingly appropriated it to that purpose. The next morning she came to us in great alarm, stating that the gold had mysteriously disappeared, and nothing was left in the parcel but the glasses. Sure enough, the metal remaining in the pores of the leather had amalgamated with the gold, and entirely destroyed the spectacles. It was a mystery which we never could explain to her satisfaction.—*Fireside Science.*

The following as to fruit in the New York market, from the *Tribune*, will be of interest to Ohio exporters: Bartlet pears are selling for $3 per bushel for prime fruit, and other varieties at from $3 a barrel up to $7. There has never been in the history of the fruit trade of this city a better prospect for a fine pear crop than this season. The Bartlett pears, which usually are all gathered before the end of September, will doubtless, notwithstanding the extent of the crop, sell for good prices, not frequently going below $5 for good stock. The scarcity of peaches will create an extra demand for them. Early apples will be abundant for the next month, and cheap. Sour Boughs will sell for $1 a barrel and upward, and Red Astrachans for $2 and upward. Currants will continue to come into market for the next week, and as there are many more of them grown than can possibly be used they will continue to sell for three or four cents a pound or less until the last. The warm weather and high winds are drying up the huckleberries and blackberries very fast and the want of copious rains has cut short the supply. Blackberries, which ten days ago were sold as low as $1.25 a bushel, sold readily on Friday and Saturday last for $2.50 to $3 a bushel.

No less than 1,500 cases, or one hundred tons of honey, all purchased from Los Angeles apiarists, have been shipped from Los Angeles by the Bark Papillon to Havre, France, whence it will doubtless find its way to the French capital, where it will be readily marketed at a good profit to the shipper. There is no mistaking Southern California honey when one has once tasted the genuine article. The shipment by the Papillon will serve to show the people of Paris the difference in flavor and delicacy of sweetness of the pure article garnered by the bee from the spurious manufacture now flooding the markets of Europe. There is a vastness about one hundred tons of honey, which will make this shipment memorable. Its profitable sale will open to our apiarists an unlimited market, and probably a material enhancement of prices.

The first paper mill in the United States was established in Germantown, Pa., in 1690. The first paper company in Massachusetts was granted a patent in 1728. The mill was started in Millford in 1730. It was run with varied success for some years and then ceased operations. In 1760 a Bostonian got a furlough for an English soldier who understood paper making, and the mill was again started. In 1776 the Legislature passed resolutions for the appointment of a suitable person in each town to receive rags, and the people of the State were urged to save their rags for paper making. In 1799 Zenas Crane of Worcester, journeyed to Dalton and there began the business in which his sons and grandsons are still engaged in the same town, and his fellow pioneer, David Carson, has also descendants engaged in the business and owning the original mill site.

English Traveling Trunks.—"As the season for traveling is now coming on, a word or two on traveling trunks may not be out of place. These articles although not classed with hollow-ware are hollow in every sense of the word. The bulk of them appear to be like fire balloons, intended only for one journey. The trunk is usually made of thin untinned sheet-iron, and as this cannot be soldered, the sheets are grooved or seamed together, and then disfigured with what is intended for oak graining with japan. They are next bedizened with what appears to be strong brass plates, which have taxed the skill of the moulder to make them look as heavy and weigh as light as possible; and when it is considered that this article is bought mostly by young persons who have none too much money, it seems a great shame that they should be thus imposed upon. At the end of one journey these trunks are generally a complete wreck, and the railway porters are blamed for what fairly belongs to the maker of the box."—*Martineau & Smith's Hardware Trade Journal, Birmingham.*

Soft Solders.—The fusibility of soft solders is increased by adding bismuth to the composition. An alloy of lead four parts, tin four parts, and bismuth one part is easily melted: but this alloy may itself be soldered with an alloy of lead two parts, bismuth two parts, and tin one part. By adding mercury a still more fusible solder can be made. Equal parts of lead, bismuth and mercury, with two parts of tin, will make a composition that melts at 122° Fah., or an alloy of tin five parts, lead three parts and bismuth three parts will melt in boiling water. In mixing these solders melt the least fusible metal first in an iron ladle, then add the others in accordance with their infusibility. To cast strips of solder, pour the molten metal on a flat surface of stone or metal, drawing the ladle along the while to leave a thread of metal of the desired substance.—*Amer. Manufacture.*

To Bronze Wood.—To bronze wood, first stain the parts with black; take japanners' gold size with a little Roman ochre and Prussian blue; go over the black part lightly, then let it dry till it feels just sticky to the fingers, but not come off; then with a hard ball of cotton dipped in any of the bronze powders rub those places, and if you think proper, give it a thin coat of japanners' gold size, then with spirits of turpentine.

Our Timber Lands.

Of the twenty-six States east of the Rocky Mountains only four—Maine, Michigan, Minnesota and Wisconsin—are now able to furnish supplies beyond what they themselves need. It is a remarkable fact, however, that nearly every State in the Union exports timber. Maine is so far denuded of what once were thought inexhaustible supplies of spruce that the lumber men are forced to the head waters and tributaries of every river in the State to hunt for supplies, and the mills are being stocked to a large extent with logs cut from saplings of only six and eight inches in diameter. Much of the timber so recklessly destroyed is used, not to supply its own needs, but to ship into neighboring States and abroad. Ohio forests of walnut have almost all disappeared. There have now been cleared upwards of 10,000,000 acres of this valuable timber, which it would take half a century to restore. Fires, insects and the axe have almost entirely denuded New York of its timber. The Northern sections of Michigan and Wisconsin are well supplied with pine, better perhaps than any other States in the Union, but it is thought that the timber will not last eight years longer. Lumbermen have now to seek the headwaters of the tributaries. No reliance can be placed on Canadian supplies. From the Province of Manitoba to the Gulf of St. Lawrence there is not as much spruce, pine, hemlock, ash, oak, elm and other commercial woods as would supply the present consumption of the United States for three years. All the accessible pineries have been run over for salable timber, and some of the Canadian lumberers have tresspassed upon our Northwestern Territories in their efforts to secure board wood timber to supply the English demand. The value of the annual product of our forests is said to be near $1,000,000,000. A very large proportion of this is obtained in a legitimate way, but millions—billions, in fact—of feet of splendid timber are annually stolen. The trade in this stolen timber in Northwestern Florida is immense, and gives employment to thousands of men. Timber-stealing is not confined to Southern States. In the North and West some of these timber-thieves buy Government land at settlers' rates, and after they have cut and sold the timber allow it to go back to the Government in default of taxes; thus not only swindling and robbing the Government, but preventing actual settlers from getting possession of the land. Others evade the law by getting the Indians to cut the timber from the Government lands, and have them haul it to safe places beyond the jurisdiction of the Government, when they buy it, paying only the price of cutting it. Probably not less than $30,000,000 people in the United States are warmed by wood fuel, consuming annually abont 100,000,000 cords. In 1871 Chicago alone consumed the wood taken from 10,000 acres of forest land. Steamboats, railroads, &c., consume in the same way about 35,000,000 cords. The railroads consume an enormous amount of wood for ties, bridges, fences, &c. The amount of wood consumed by mechanical industries is very large. People may realize to some extent how large the amount must be by simply taking a look at the objects before their eyes in their houses, when they will perceive how very few the articles that are not wholly or in part constructed of wood. Besides establishments manufacturing articles entirely of wood, there are those in which wood forms an important part, such as furniture, ships, carriages, &c., employing nearly 900,000 persons, and using materials worth $600,000,000.

French Wood Polishing.

Fill up the pores of the wood with plaster of Paris and water. When dry, oil with linseed oil, then apply French polish (which can be purchased at oil shops), through the medium of a rubber made of wadding. Place over rubber when charged with the polish solution a piece of soft calico rag, and apply it to the wood, working the rubber in a circular direction until the pores are filled and the surface of the wood is glazed by the cohesion of the resinous deposit, aided by friction. To make the rubber work pleasantly, apply just a drop of linseed oil to the surface of same. Let the work stand to harden, then repeat as before, finishing off with alcohol.

The price of wheat advanced to $1.47½ in San Francisco on the 1st inst. on account of the increase in the supply of vessels for shipment.

MINES AND MINING.

It is reported that one of the diamond mines which were included under the celebrated name of Golconda is in a condition to be worked again with profit, and that the industry which once made Central India famous is about to be revived. Near the modern town of Hyderabad are the ruins of the hill-fort and city of Golconda where lived three centuries ago an independent prince who ruled a vast territory. The diamonds were not found in the immediate neighborhood of his capital, but were carried thither from villages in the vicinity.

Wherever in any part of the world, says Fuller, in his treatises on silver mines, silver mines have been worked, they are worked now, unless from war, invasion of Indians, etc., work has been interrupted. We know of no silver mining region that have given out. Mexican mines worked by the Aztecs before the conquest by Cortez, are still worked as profitably as ever; the old Spanish mines, opened long before Hannibal's time, are still worked with enormous profit; the South American mines have constantly yielded their wealth for more than 300 years; mines in Hungary that were worked by Romans before the Savior's time, still yield abundance of ore; the silver mines of Freiburg, opened in the eleventh century and worked continually ever since, yield their steady increase. So in Norway, Sweden and Russia, and indeed wherever silver mines have been opened, almost without exception, they continue to be worked to the present day; and are generally more productive than at any time in their past history.

Philadelphia capitalists are becoming largely interested in Virginia properties. The news received this week from the Old Dominion states that a large number of the old mines on the gold belt, which were abandoned when the war broke out, have resumed operations and a number of new ones have started up with brilliant prospects, so that gold mining is becoming more active every day.—*N. Y. Eng. & Mining Journal.*

The Leadville, Col., Herald says: It is evident the Little Pittsburg is very nearly exhausted in all its old workings, and that unless mineral is found on the ridge to the south, or else at lower depths, no hopes can be entertained of the company ever working its mines to a profit.

Shipments of ore from the Chrysolite, Col., are now about ninety tons a day. The *A Sand* ore averages one hundred and twenty-five ounces in silver to ton. One hundred and twenty tons was settled for that netted over fourteen thousand dollars. More ore is now being shipped from Chrysolite than at any other time in the past ten months. Smelters have on hand $40,000 worth of ore.

At Silver King Mine, Arizona, there are 6 to 8,000 tons of ore on the dumps, as much as they can work in half a year, and ore in the mine lies in masses ready to hoist up. Mill running full force. Fifteen bars, 18 809½ ounces, value $24,043,28 were lately shipped.

The Bay Horse Mining and Smelting Co., Bay Horse District, Idaho, will turn out says the Challis Messenger from fifty to sixty-five tons of bullion monthly, assaying from 600 to 1,100 ounces in silver per ton.

The mine of the Tiger Mining Company, Prescott, Arizona, was discovered ten years ago, and some fine ore, worth $1,000 a ton was shipped to San Francisco. A company was incorporated, the local papers bolstered it up as the Comstock of Arizona before there was a shaft on the vein fifty feet deep, and a foot ball was made of the stock for awhile, till the insiders unloaded at high figures—and then it fell flat and all operations ceased at the mine—a large amount of ore, (700 or 800 tons as estimated,) lay on the dump for a long time till the stock was gathered into a few hands and then a mill and expensive hoisting works were put up, assessments were levied; the papers tooted their horns again and the ore on the dump was worked, bullion shipped, the stock went up and the Tiger was booming for a while. Now the whole property is advertised to be sold at sheriff's sale for the sum of $3,238 and costs and accruing costs, etc., and besides there are other judgments and attachments amounting to a respectable sum. It is supposed that the usual game is being played that has worked well so often in mining companies—those controlling the stock will not pay the indebtedness—but will let the property be sold, buy it in due time and revive the business after the small shareholders have dropped through out of sight.—*N. Y. Mining Record.*

REVIEWS.

A Fearful Responsibility and Other Stories. By Wm. D. Howells. Boston: James R. Osgood & Co.

The first novel opens with a life in exile in Venice of Mr. Elmore and his wife, with their adoption of a girl of "simple, fresh open loveliness," who constitutes the responsibility; it develops into a story of love and mystery The second novelette entitled "At the Sign of the Savage" is laid among German scenes—the black Forest, Salzburg, Vienna, being the adventures of a Colonel who gets into a series of discomfitures, and in the end curses his weakness in being misled by a designing bachelor friend to admire "the yellow-haired German and dark-eyed Hungarian women," and whose ignorance of the country is amusingly played on by the Vienna United States Consul. The third division of the work is a Venetian story entitled Tonelli's Marriage. All three are admirably written, with fine touches of life and contrasts of character and we heartily commend it for summer reading.

The Westminster Review for July, 1881. American Edition. New York: Leonard Scott Publishing Company, 41 Barclay Street.

The contents of the July number of this able magazine are Characteristics of Aristotle, Island Life, Mr. Fitzgerald's Life of George the Fourth, the Sugar Bounties Question, the Development of Religion, George Eliot, her Life and Writings, India and our Colonial Empire, and a survey of contemporary literature in all its leading branches. We are not satisfied, by the way, with the reviewer's estimate of Aristotle, which denies to him the philosophic gift, crediting him merely with looking on the surface of things and regarding only existent material order. The evidence by which this view is sought to be supported is of the flimsiest character, regard being had to the time in which Aristotle lived and the position of science in his day; besides it is so contradicted by after admissions of the writer that we begin to doubt whether he knows what philosophy truly is. Mere assumptive articles are at a discount in this hemisphere at least. The article would have been of tenfold interest had it given us more of Aristotle's actual writings and investigations.

The Edinburgh Review for July, 1881. No. CCCXV. American Edition. New York: Leonard Scott Publishing Co., 41 Barclay Street.

The able articles in the July issue of this famous periodical ate: Methodism, Cæsar's Campaigns in Great Britain, Sweden and Gustavus III, the Society of Antiquaries, Japan Revolutionized, the Revised Version of the New Testament, Life of Lord Clyde, Henry IV. and Philip III, the Storage of Electricity, Landlords and Tenants in Ireland.

The Optogram.—Soon after Professor Boll, the eminent German physiologist, made the discovery that images of external objects remained on the retina of animals after they had expired, it was suggested that the eyes of persons who had been murdered, or had otherwise met with a mysterious death, should be examined in order to see whether the last scene was not impressed upon their retina. Some clew might in such a case be found to the circumstances in which they had met their fate. The question has been exhaustively studied by Dr. Ayres in the laboratory of Professor Kuhne, at Heidelberg. Upward of a thousand experiments have been made by him, but all with poor success. The best results were got by exposing the eye of a living rabbit, which had been dosed with atrophine, to a photographic negative of Prof. Helmholtz, and on examination the eye was found to retain an imperfect optogram of his nose and shirt collar: but it disappeared in time, owing probably to the renewal of the visual purple by the circulation of the living creature. To exclude this effect Dr. Ayres held the photograph to the dissevered head of a rabbit, and thought the image obtained was more permanent, but it was by no means distinct enough to warrant any hope of the optogram proving useful for the detection of crime.

SCIENCE AND INVENTION.

MACHINE FOR RAISING WATER.—Rotary machines for elevating water have been in use for a long time; but hitherto they have generally consisted of an immovable cylinder, in which the water is circulated by rotating paddles until it acquires the centrifugal force necessary to elevate it through a pipe. The height attained by the water in this way has been about 100 feet: and with the rotary elevator of M. Girard this lift is increased to 130 feet, the highest limit yet reached. Recently, however, says *Engineering*, a new machine was brought before the French Academy of Sciences, which is capable of raising water to a much greater altitude. It is the invention of M. de Romilly and a laboratory model worked by hand projects water to a height of 500 feet. This centrifugal elevator consists of a flat horizontal cylinder or pan which is fed with the water to be elevated, and rotated very quickly round a vertical axis by means of a pulley. The motion of the pan causes the water to circulate in a ring round the internal walls of the pan, and a tube reaching down from the height to which the water is to be raised is brought into the pan, and terminated in a curved nozzle, which is turned toward the circulating liquid. The water, by virtue of its acquired momentum, rushes into the mouth-piece and rises up the tube. In this case the turbine or pan is situated at the level of the source, but M. de Romilly also arranges for its being placed at the level of the overflow, or some intermediate point. In the latter case the discharge tube, after leaving the pan, is bent downward into the source of water, where its point, like a spigot into its faucet, enters a second tube, which rises again to the receiving cistern on the upper level. To work this arrangement some water is let into the pan by a supply pipe from the upper cistern, and the turbine is rotated. The flying water then enters the tube leading downward, and its passage to the second tube sucks in the surrounding water from the source, which is thus carried upward to the elevated cistern, from which it is allowed to flow away.

ROLLING OF WIRE AND FINE IRON.—The cold rolling of wire and fine iron by means of small rollers with semi-hexagonal grooves forming a hexagonal section, is proposed by Mr. Julies Schmidt (Schmidt Brothers,) of Schwelm, Westphalia. The application of the hexagonal rollers has the advantage that the wire or fine iron is always under a central pressure, the structure of the metal will not alter, and the formation of seams is avoided. Each pair of rollers is carried in little bearings fixed on a standard. All standards rest on a foundation plate, which at the same time carries the main standards on which the plummer blocks for the driving shafts are fixed. The latter serve for the motion of the rollers; the train of wheels is so arranged as to obtain such speed and direction of motion that the wire will pass through the rollers first one way and then the other, or alternately forward and backward.

THE shares of the Homestake and Deadwood-Terra are intrinsically worth as much or more than ever before. There is no sign of exhaustion in either mine. The present monthly product of the Homestake is said to be above $200,000. The depreciation is due to the state of the market, coupled with the absence of all effort to support the price of their shares on the part of the management.—*Ibid.*

MARKETS.

FINANCIAL.

Office of the TRADE REVIEW,
FRIDAY EVENING, Aug. 12.

There has been a fair activity in banking circles. Discount rates are steady at 7 to 8 per cent; time paper is offered at 6 per cent; call loans are negotiated at 5 per cent. The market for Government bonds closes strong at the following quotations for Government bonds: U. S. 4½s., 91 registered, 113¼ bid, 113⅜ asked; U. S. 4½s, '91 c. 114⅛ bid, 113⅛ asked; U. S. 4s, 1907, reg., 116⅜ bid, 116¾ asked; U. S. cur. 6s.. 1895, 130 bid; U. S. cur. 6s 1897, 132 bid: U. S. con. 5s, 102⅛ bid, 102¼ asked; U. S. con 5s. 102⅛ bid, 102¼ asked.

NEW YORK.--In stocks a temporary apparent strength has been given to figures. The advance is general but there is evidently a feeling of uncertainty as to prices being sustained. There has been a fractional recovery of prices in the railroad bond market, sympathetic with the movement in stocks. The foreign exchanges are still dull, but rates are harder without change in the nominal quotations.

IRON.

An improvement is to be noted in nearly all classes of iron. The decided upward movement is not attributable to any speculative operations but to consumptive demand. The advance applies to all classes of finished iron. Manufacturers of bar iron decline to make contracts for future supplies at present prices. Orders of mills for plate iron reach months ahead. Sheet iron is active. Steel is less affected by the rise in iron than other finished products. We quote Best English cast, 14@15½c; American do do 12@12½c; Bessemer machinery, 5@6c; crucible do, 7@7½c; wedge and German, 7c; English spring and caiking, 7@7½c; American spring and calking, 5@5½c; tire, 3½@8¼c; sleigh shoe, 2@3¼c. At Cincinnati the market exhibits increased activity and strength in car-wheel and foundry grades, though prices are not quotably higher. With the stoppage of operations in a large number of the mills forge irons are neglected.

CINCINNATI.--(Reported by E. L. Harper & Co.)--The market has the same still bouyant tone noted in our last report and the movement in all grades in pig have very active We quote the following prices: Foundry Irons-No. 1 Hanging Rock Charcoal, $26.00@$27.00; Strong Neutral Coke, $22.50@$23.50; American Scotch. $20.00@$21.50 Grey Forge--Neutral Coke, $20.00@$21.50; Cold Short, $19.00@20.00. Car Wheel and Malleable--Hanging Rock Cold Blast, $36.00@38.00; Hanging Rock Warm Blast, $30.00@32 00; Southern Car Wheel, $34.00@$35; Lake Superior, No 1 and 2. $32.00@33.00; Lake Superior, No. 3 and 6, $34.00@$35.

COPPER.

The consumptive demand is good. The production of the Lake region the first six months of this year has been 64,000,000 pounds, equal to about 50,000,000 pounds of fine copper. We quote the sale of small lots at 16½@16⅝c.

LEAD.

There is an active inquiry for lead. It is difficult to secure soft lead; hard rules at 4.7 cents.

COAL.

A large amount of coal has been placed in Cleveland the past week. Shipments are active. Prices are without material change. With the activity of manufactures the prospect is one of increased consumption. Freight rates are weaker. Miners throughout the State are actively employed, and no labor troubles have developed. We quote: Brier Hill coal, $3.50@$4.00; Willow Bark coal, $3.15; Fox Lake, $3.15; Massillon coal, $3.00; Cannel coal, $3.75; Blossburg, $4.00; Carbon Hill, $2.90; Straitsville, lower vein, $2.80; Shawnee, f. o. b. at Sandusky, $2.80. Following are car load prices to dealers on track: Massillon lp, $2.85@3.00; Massillon nut, $2 50@$2 75.

TIN AND TIN PLATES.

Tin is somewhat firmer and Straits has been disposed of at 20¼ cents. Tin plates are unchanged in price but the demand has improved.

HARDWARE.

Prices in the different lines are generally unchanged. The demand for tools continues unabated. The trade in nails is not as active as had been anticipated. Selling prices advanced to $3. The development of mechanical industry assures hardware trade of a long and profitable period of activity. The feature in business for the year has been the absence of a rush at stated periods with a continuous and well sustained demand, which in the end must afford equally satisfactory returns. Nuts and washeas have been advanced ¼c. per lb. The jobbing rate on sheathing copper and on copper bottoms has been reduced 1c. per lb.

WOOL.

Wool has been somewhat more active the past week. The market continues to be well supplied with all descriptions of domestic wool. The following are our quotations: Ohio XX, 41@43; Ohio X, 41@42; Ohio No. 1, 45@47.

GRAIN.

Large speculations are going on in wheat. Cargo receipts are there looked for in the next three weeks. There is likely to be a large forward movement eastward of corn, and a sharp turn of the market consequent on the large amount of last winter's corn may be looked for. The following are cash quotations on 'Change: Wheat—No. 2 red at $1.22; No. 3 red at $1.17; No. 2 mixed $1.18. Corn--High mixed 58c.; low mixed 57c.; cars, 55c. Oats--No. 1, 42c.; No, 2. 41c; white 44c. Barley--State—90@$1.00; Canada, $1.15@$1.25; Rye--Held 85c.

FLOUR.

Market active. We quote: City made patents, $7.25@8.00; New process, $7.00; Fancy Straights, $6.75; Amber, $6.50

COUNTRY BRANDS.--Patent process, $7.00@$8.00; Straight new process, $6.75@7.00; Amber, from store, 6.25@6.50; Amber in car lots, $6.25; Minnesota Spring $6.25@6.50; Minnesota, patent process, $8.00@8.25. RYE FLOUR.--Steady at $6.25 per bbl.

Shipments of Lake Superior Iron Ore.

The following table exhibits in gross tons, the total lake shipments of iron ore the present season, up to and including July 27, together with the amount shipped during the corresponding period last year:

WHERE FROM.	1880.	1081.
Escanaba	532,794	606,729
Marquette	308,929	283,724
L'Anse	20,922	22,912
Total	862,645	913,365

LUMBER.

PLANK.

2 INCH--MIXED WIDTHS.

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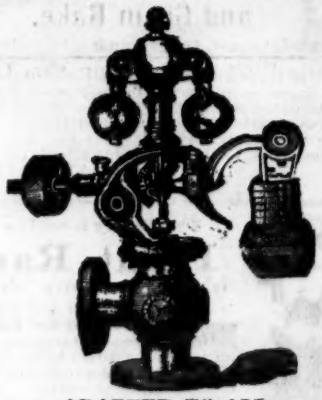

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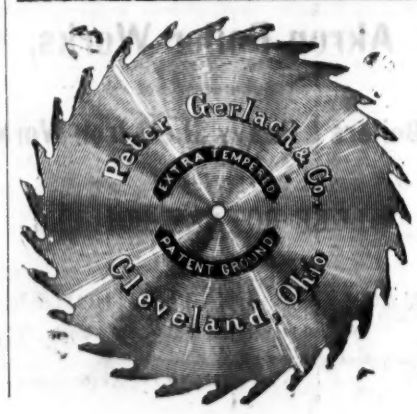

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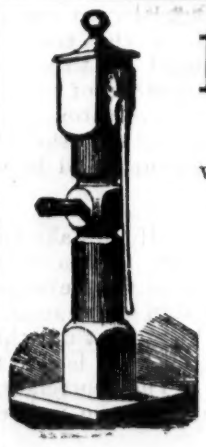

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